

MEMORIAL RESOLUTION

Hollis R. Johnson

1928-2019

The astronomical community will remember Hollis R. Johnson not only for the excellence of his groundbreaking research but also for his personal warmth and enthusiasm. Through his kindness and wisdom, he made everyone around him better people, as well as better astronomers.

Born in 1928, Hollis grew up in Garland, Utah, where the dark, starry nights inspired his interest in astronomy. He served in the Army Message Corps in the early 1950s, stationed in Germany. While in Europe, Hollis met his future bride, Grete Margit Leed, in Denmark, and they married in 1954.

Hollis completed an undergraduate degree in physics in 1955 and a master's degree in physics in 1957, both at Brigham Young University. He then entered the Ph.D. program at the University of Colorado at Boulder and earned a Ph.D. in astrophysics in 1960 for his dissertation in solar physics titled "Helium Equilibrium in the Solar Atmosphere." Following post-doctoral positions at the Paris Observatory and at Yale University, Hollis was recruited to Indiana University by Frank Edmondson and Marshall Wrubel. During his early years on the faculty, Hollis continued his research on the Sun, particularly on the temperatures and densities in the solar chromosphere and corona.

Hollis then switched his focus to the study of the atmospheres of other stars, especially cool, red giant stars, whose atmospheres are riddled with molecules that contribute significant opacity. His 1980 paper with Bernat and Krupp (Johnson et al. 1980, ApJS, 42, 501) demonstrated the importance of water vapor opacity at effective temperatures as low as 2500 K, and explored the validity of standard assumptions about plane parallel geometry, microturbulence, and neglect of turbulent pressure when modeling the extended atmospheres of these cool stars. His paper with Sauval (Johnson and Sauval 1982, AApS, 49, 77) computed molecular equilibria in red giant atmospheres. They considered 1600 different atomic and molecular species formed by the combination of 83 chemical elements and evaluated column densities to determine the importance of each in red giant spectra. This involved a pioneering effort in the use of high-performance computers to model these complex stellar atmospheres. Their computations of the column densities for dozens of diatomic and triatomic molecules as a function of effective temperature still provide a useful guide for what might appear in a red giant spectrum.

During the 1980s, Hollis began using the International Ultraviolet Explorer satellite (and later, the Hubble Space Telescope) to study the ultraviolet spectra of cool stars, collaborating widely with astronomers from around the world. Hollis used his expertise on the atmospheres of cool

stars to examine the properties, compositions, and chromospheres of red giants, supergiants, and carbon stars, and was widely recognized internationally for his leadership in this field.

During his years on the faculty at Indiana University, Hollis directed sixteen doctoral dissertations, mentored numerous postdocs, and taught at all levels. Hollis particularly enjoyed close working relationships with his graduate students. His graduate courses on solar physics, and later, stellar atmospheres, became legendary. He excelled equally at teaching introductory courses for non-science majors, especially elementary education majors, and at teaching more advanced courses for astronomy majors. He was a compelling classroom presence. He also enjoyed working with school children and gave many public lectures around the state of Indiana. Hollis chaired the Department of Astronomy at Indiana University twice and served on a variety of campus committees. He was also president of the campus chapter of Sigma Xi. For many years, Hollis represented Indiana University on the Board of Directors of the Association of Universities for Research in Astronomy and served on the Observatories Visiting Committee. Hollis was especially proud of organizing IAU Colloquium 106, "The Evolution of Peculiar Red Giant Stars," in 1988. The colloquium brought many distinguished visitors to Bloomington and led to a deeper understanding of the evolutionary connections of the diverse classes of peculiar red giants. Hollis chaired the IAU working group on Peculiar Red Giant Stars from 1988-1991 and served the IAU in a variety of other capacities, as well.

No discussion of Hollis's life would be complete without mentioning his devotion to The Church of Jesus Christ of Latter-Day Saints, including service as bishop, stake president, and counselor. Hollis undertook an extended mission in Denmark in 1948-1951, and Hollis and Greta undertook three 18-month missions in Denmark, Ghana, and China after Hollis's retirement from Indiana University in 1994.

In addition to these many professional and service accomplishments, Hollis projected delight in his interactions with everyone, and he did much to promote a love for astronomy. Just getting a hearty greeting from Hollis in the hallway could buoy your spirits. His colleagues and former students will remember him fondly.

We request that this memorial tribute to Hollis Johnson be presented to the members of the Bloomington Faculty Council, that it be preserved in its minutes and archive, and that after its presentation copies be sent to the members of his family.

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